

Expression Vector Kit) to obtain recombinant vectors. This operation was carried out concretely as follows: Each of the above-mentioned commercially available interferon  $\alpha$  genes was inserted into the *Swa* I site of a cosmid vector pAxCAwt (44,741 bp), Niwa, M. et al., (1991) Gene 108, 193, this cosmid vector is included in the above-mentioned commercially available Adenovirus Expression Vector Kit). The cosmid vector having the inserted gene and the above-mentioned commercially available adenovirus-derived DNA-TPC (Miyake, S. et al., (1996), Proc. Natl. Acad. Sci. USA 93 1320) digested with the above-mentioned restriction enzyme were co-transfected into 293 cells (human fetal kidney cell, commercially available from DAINIPPON PHARMACEUTICAL CO., LTD). The 293 cells were cultured in 10% FCS-containing DMEM medium under 5% CO<sub>2</sub> at 37°C until 100% confluency is achieved, and 10  $\mu$ g of the above-mentioned cosmid vector DNA and 5  $\mu$ g of the restriction enzyme-treated DNA-TPC were mixed on a petri dish with a diameter of 6 cm. The transfection was carried out by the calcium phosphate method. The cells after the co-transfection were cultured at 37°C under 5% CO<sub>2</sub> for 24 hours, and the fragment of grown recombinant adenovirus was recovered. The collected fragment was injected into ovaries of *Pinctada fucata Martensii* in an amount of 100 to 200 mg DNA/ovary. Sperms (twice amount of eggs) were mixed with the eggs in a test tube to carry out fertilization. The resulting eggs were cultured in sea water at 25°C for 24 days to obtain young shells. In 31